

SENT BY:

0298186711;

28-FEB-02 10:48AM;

PAGE 7

MARKED UP COPYBRIEF DESCRIPTION OF THE DRAWINGS

Notwithstanding any other forms which may fall within the scope of the present invention, preferred forms of the invention will now be described, by way of example only, with reference to the accompanying drawings in which:

Fig. 1 illustrates the method of the preferred embodiment; and

Fig. 2 illustrates a block diagram of the ARTCAM type camera.

DESCRIPTION OF PREFERRED AND OTHER EMBODIMENTS

The preferred embodiment is preferably implemented through suitable programming of a hand held camera device such as that described in the concurrently filed application entitled "A Digital Image Printing Camera with Image Processing Capability" filed concurrently herewith by the present applicant the content of which is hereby specifically incorporated by cross reference and the details of which, and other related applications are set out in the tables below. Figure 2 shows a block diagram thereof.

The aforementioned patent specification discloses a camera system, hereinafter known as an "Artcam" type camera, wherein sensed images can be directly printed out by an Artcam portable camera unit such as illustrated in Fig. 2. Further, the aforementioned specification discloses means and methods for performing various manipulations on images captured by the camera sensing device 30 leading to the production of various effects in any output image 40. The manipulations are disclosed to be highly flexible in nature and can be implemented through the insertion into the Artcam of cards having encoded thereon various instructions for the manipulation of images, the cards 9 hereinafter being known as Artcards. The Artcam further has significant onboard processing power by an Artcam Central Processor unit (ACP) 32 which is interconnected to a memory device 34 for the storage of important data and images.

In the preferred embodiment, autofocus is achieved by processing of a CCD data stream to ensure maximum contrast. Techniques for determining a focus position based on a CCD data stream are known. For example, reference is made to "The Encyclopedia of Photography" editors Leslie Stroebel and Richard Zakia, published 1993 by Butterworth-Heinemann and "Applied Photographic Optics" by London & Boston, Focal Press, 1988. These techniques primarily rely on measurements of contrast between adjacent pixels over portions of an input

SENT BY:

0298186711;

28-FEB-02 10:49AM;

PAGE 8

image. The image is initially processed by the ACP 32 in order to determine a correct autofocus setting.

This autofocus information is then utilized by the ACP 32 in certain modes, for example, when attempting to locate faces within the image, as a guide to the likely size of any face within the image, thereby simplifying the face location process.

Turning now to Fig. 1, there is illustrated [1] an example 1 of the method utilized to determine likely image characteristics for examination by a face detection algorithm 10.

Various images eg. 2, 3 and 4 are imaged by the camera device 28. As a by product of the operation of the auto-focusing the details of the focusing settings of the autofocus unit 5 are stored by the ACP 32. Additionally, a current position of the zoom motor 38 is also utilised as zoom setting 6. Both of these settings are determined by the ACP 32. Subsequently, the ACP 32 applies [any] analysis techniques in heuristic system 8 to the detected values before producing an output 29 having a magnitude corresponding to the likely depth location of objects of interest 21, 31, or 41 within the image 2, 3 or 4 respectively.

SENT BY:

0298186711;

28-FEB-02 10:49AM;

PAGE 9

Next, the depth value is utilized in a face detection algorithm 10 running on the ACP 32 in addition to the inputted sensed image 11 so as to locate objects within the image. [A close] An output 29 corresponding to a close range value indicates a high probability of a portrait image, as in image 2, a medium range indicates a high probability of a group photograph as in image 3 and a [further] higher range indicates a higher probability of a landscape image as in image 4. This probability information can be utilized as an aid for the face detection algorithm 10 and also can be utilized for selecting between various parameters when producing "painting" effects within the image 2, 3, or 4, or painting the image with clip arts or the like, with different techniques, [or] clip arts being applied depending on the distance to an object.

It would be appreciated by a person skilled in the art that numerous variations and/or modifications may be made to the present invention as shown in the specific embodiment without departing from the spirit or scope of the invention as broadly described. The present embodiment is, therefore, to be considered in all respects to be illustrative and not restrictive.

The present invention is further best utilized in the Artcam device, the details of which are set out in the following paragraphs although it is not restricted thereto.